



## Closed Versus Open Lateral Internal Sphincterotomy in Treatment of Chronic Anal Fissure: A Comparative Study

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### Abstract

**Background:** An anal fissure is a common and painful disorder. The most common surgical treatment of a chronic anal fissure is lateral internal sphincterotomy with either open or closed methods, associated with a risk of pain, bleeding, recurrence and incontinence.

**Objectives:** This study was designed to compare the results of an open and closed technique of lateral internal sphincterotomy in the treatment of chronic anal fissures.

**Patients and Methods:** One hundred patients with a chronic anal fissure were admitted to the surgical unit of Tikrit Teaching Hospital, during the period of Jan. 2011 to Jan. 2012, treated by open or closed lateral internal sphincterotomy. The patients were followed up for a period of 12 months after surgery. The results of treatment were evaluated with reference to postoperative complications and outcomes.

**Results:** Out of the 100 patients included in the study, 50 patients underwent open lateral internal sphincterotomy and the other 50 patients were subjected to closed lateral internal sphincterotomy. There was a significant difference in postoperative complications. However, incontinence was 20% in the open method and 8% in the closed method, the recurrence rate being 12% in open and 8% in closed methods; and the infection was 8% in open and 2% in the closed method.

**Conclusion:** Closed lateral internal sphincterotomy is the treatment of choice for a chronic anal fissure with an acceptable complications rate.

**Key words:** Anal fissure, lateral sphincterotomy, open, closed

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### Introduction

A chronic anal fissure is one of the most frequent proctological disorders in the world and may sometimes affect the patient's quality of life. Thus, rapid effective treatment is a priority [1-3].

The etiology of this condition is con-

troversial, but it is generally accepted that a spasm of the internal anal sphincter plays a fundamental role in its pathogenesis. Therefore, there is a vicious circle: fissure - internal anal sphincter spasm - pain [4,5]. Consequently, internal lateral sphincterotomy has been widely accepted as the treat-

ment of choice in a chronic anal fissure, since it relaxes the hypertonic sphincter, thereby reducing anal pain and allowing the fissure to heal [6].

Lateral internal sphincterectomy was described by Eisenhammer in 1951 and 1959. Among many treatment modalities for a chronic anal fissure, lateral internal sphincterotomy remains the first line of treatment. It is more popular in North America. It is performed by two techniques: Closed method and Open method [7,8].

The aim of lateral internal sphincterotomy is to divide the distal third to one half of the internal anal sphincter [9]. It can be performed under local or general anesthesia. The patient is positioned in the lithotomy, lateral (side) or jack-knife positions according to the surgeon's preference. It can be performed in the office or in the hospital [10].

This study was designed to compare the results of the open and closed technique of lateral internal sphincterotomy with reference to postoperative complications and outcomes.

### Patients and Methods

The present prospective study was conducted at Tikrit Teaching Hospital during the period of January 2011 to January 2012. A total of one hundred patients with a chronic anal fissure from an out-patient clinic, emergency department or private clinic were included in this study. All the patients were interviewed at their admission to the hospital and formulae were recorded on special questionnaire formulae for each patient.

These patients were evaluated and diagnosed as having an anal fissure through a detailed history and physical examination, and were prepared for surgery by being admitted to the surgical ward, where routine investigations were done, i.e. hemoglobin percentage, blood sugar and general urine examination. In patients above 40 years of age, an ECG and chest x-ray were also performed.

The patients are divided into two groups. Each group includes 50 patients. Group A was treated by a closed method and group B was treated by an open method. The surgery was done in the theater under general anesthesia or spinal (caudal) or under local anesthesia (in our study, mainly on local anesthesia) in a lithotomy or jack-knife position.

A closed method or technique was done by insertion of an anal retractor, then the retractor was opened until the tight internal sphincter is palpated as a tight band within the canal. The intersphincteric groove marks the distal end of the internal sphincter and is easily palpable. A blade scalpel (Beaver's blade) or number 11 blade scalpel is introduced through the perianal skin at the left or the right lateral aspect of the canal at 3 or 9 o'clock. The canal sandwiched parallel between the anoderm and the internal sphincter, when the tip of the blade reaches the dentate line of the blade, is turned inward and forward, and the internal sphincter muscle is divided with the blade; about one third or one half of the sphincter was divided.

The surgeon (operator) can easily be determined when the sphincterotomy is completed because the operator can palpate the gap when these fibers have been divided. The blade is removed and gentle pressure is applied to control bleeding.

An open procedure or technique with clear identification of the muscle before its transaction was done by a radial 1cm incision being made in the lateral aspect of the perianal skin at 3 or 9 o'clock. The hemostasis is obtained and a delicate dissection is done with a curved hemostat (curved artery forceps) in the intersphincteric plane. The white hypertrophied band of muscle is then elevated into the wound with a curved hemostat. The lower one-third or one-half is divided with electrocautery or by scissors, then pressure is maintained for a few minutes to ensure good hemostasis. The wound healed through secondary intention or was closed with a chromic catgut 2/0 or 3/0 suture.

Patients were followed for 12 months after surgery to assess the results and the complications of these procedures (pain, bleeding or hematoma, infection or abscess formation, fistula formation, incontinence and recurrence).

Several descriptions to explore our analysis were used for data presentation by tables, graphs and bar charts. Statistical significance was calculated by using the chi-square test after ensuring that data fulfilled test criteria. Also, the evaluation of data was done by using mean (average), standard deviation and a standard test to compare the mean of both groups. A  $p$  value  $< 0.001$  is significant.

## Results

Among one hundred patients having a chronic anal fissure, 78% were male and 22 (22%) were female, with the male-to-female ratio being 3.5:1 (Table 1). Their age ranged from 20-50 years, with a mean age of  $35 \pm 5$

**Table 1:** Sex distribution.

Sex	No. of patients	Percentage %
Male	78	78
Female	22	22
Total	100	100

**Table 2:** Age distribution.

Age (years)	No. of patients	Percentage %
20 - 30	25	25
31 - 40	55	55
41 - 50	20	20
Total	100	100

**Table 3:** Site of fissure.

Site	No. of patients	Percentage %
Posterior	85	85
Anterior	15	15
Other (lateral)	0	0
Total	100	100

**Table 4:** Mode of presentations.

Symptoms	No. of patients	Percentage %
Pain	54	54
Bleeding and Pain	30	30
Perianal swelling	10	10
Pruritus ani	5	5
Constipation	1	1
Total	100	100

**Table 5:** Postoperative complications.

Complications	Group A		Group B		P value
	No. of patients	Percentage %	No. of patients	Percentage %	
Pain	2	4%	4	8%	< 0.001
Bleeding	0	0%	2	4%	< 0.001
Infection	1	2%	4	8%	< 0.001
Incontinence	4	8%	10	20%	< 0.001
Recurrence	4	8%	6	12%	< 0.001
Total	11	22	26	52	

years. The peak incidence age of patients with a chronic anal fissure was recorded in the age group 31- 40 (55%), while there was a lower incidence age in group 41- 50 (20%) (Table 2).

Most of the patients are having a posterior midline fissure (85, 85%), while only 15 (15%) of the patients are having an anterior midline fissure, and no patients had a lateral fissure in ano (Table 3).

The patients in our study are presented with a history of pain during and after defecations, bleeding per rectum, constipation, pruritus ani and swelling at the level of the anal verge. Eighty-four (84%) patients complained of pain during and after defecation, either alone or associated with bleeding per rectum, especially in the form of a streak over the stool. Fifty-four (54%) patients suffer from some degree of anal pain alone, and about 30 (30%) patients suffer from anal pain with bleeding. Ten (10%) patients presented with perianal swelling and on examination, this was a sentinel pile. Only 5 (5%) patients presented with pruritus ani, and only one (1%) patient presented with constipation (Table 4).

The results of postoperative complications in our study are as following: Two (4%) patients complain of pain in group A (closed method), while 4 (8%) patients complain in group B (open method). Two (4%) patients complain of postoperative bleeding in group B, while no one (0%) did in group A. Postoperative infection was recorded in 1 (2%) patient in group A and 4 (8%) patients in group B. Incontinence for flatus was 4 (8%) patients in group A and 10 (20%) patients in group B. Recurrence occurs in 4 (8%) patients in group A and 6 (12%) patients in group B (Table 5).

## Discussion

Most of the anal fissures were found in middle-aged patients, about 55% of which were between 31 and 40 years of age, and the mean age in our study was 35 years $\pm$ 5. The mean age reported in different studies ranges from 30-45 years (Nahas SC [8], Leong AF [11], Hananel N [12], and Shafiq Ullah [13]).

Seventy-eight percent (78%) of patients are male and 22% of patients are female, with a male-to-female ratio of 3.5:1. In a study done by Shafiq Ullah [13], 84% of patients are male and 16% are female, with a male-to-female ratio of 5.1:1. Furthermore, in the study done by Nahas [8], 70% of patients are males and 30% are females, with a ratio of 2.3:1, and in a study done by Melange [14], 52.2% are males and 47.8 % are females, with a ratio of 1.15:1. Moreover, in a study done by Oh C [1], they reported that 50.3% are males and 49.7% are females.

The male predominance in our study may be due to the fact that most women with anal problems in our society consult a gynecologist for social reasons.

The patients suffering from an anal fissure complain of pain, bleeding, swelling and pruritus ani. In our study, about 54% of patients presented with pain only during or after defecation, and 30% of patients presented with bleeding and pain, which was very close to the results reported by Hananel and Gordon [12] (about 90.8% and 71.4%, respectively).

In our study, 85% of patients presented with a posterior midline fissure and 15% of patients presented with an anterior midline anal fissure, with 0 (0%) of a lateral type. Mazier and Levien [7] described that anal fissures are more common posteriorly; Cushieri [15] also described that most of the anal fissures are at the posterior midline. Nahas [8] reported that 86.1% are posterior and that 13.9% are at the anterior midline, and Shafiq Ullah [13] reported that 88% of patients are at the posterior midline, 10% anterior midline and 2% other (lateral).

In the patients undergoing open lateral internal sphincterotomy, about 80% of patients were free of symptoms on the next postoperative day, while in the patients undergoing closed lateral internal sphincterotomy, about 92% were. Hiltunen and Matikainen [16] and Shafiq Ullah [13] described similar results in the

case of lateral internal sphincterotomy.

In our study, the results of open and closed techniques are compared regarding pain (8% versus 4%), bleeding (4% versus 0%), infection (8% versus 2%), incontinence (20% versus 8%), and recurrence (12% versus 8%), respectively. It was noted that both techniques of lateral sphincterotomy are effective in the treatment of a chronic anal fissure. However, this study showed that closed lateral sphincterotomy is significantly better than the open technique ( $p < 0.001$ ).

Pernikoff, et al. [17] and Shafiq Ullah [13] have also reported that the complications rate is relatively higher in the open technique than the closed technique.

Kortbeek et al. [18] and Shafiq Ullah [13] had reported that closed lateral internal sphincterotomy for a chronic anal fissure is effective and may result in less postoperative discomfort, shorter postoperative length of stay and a comparable rate of complications compared with open lateral internal sphincterotomy.

## Conclusions

Closed lateral internal sphincterotomy is the treatment of choice for a chronic anal fissure. It can be done under local anesthesia as a day case, effectively and safely with an acceptable rate of complications and less postoperative discomfort.

## Recommendations

1. A closed technique should be adopted or performed by experienced surgeons.
2. A trainee should be initially trained by an open technique, then shifted to a closed technique.

## Conflict of interest statement

The authors do not declare any conflict of interest or financial support in this study

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